

Remarks

The Office Action mailed June 14, 2004 has been carefully reviewed and the foregoing amendment has been made in consequence thereof.

Claims 1-31 are pending in this application. Claims 1, 2, 9, 10, 12, 14, and 21-31 have been canceled. Claims 1-3, 6, 7, 9-14, 17, 18, 20-23, 26, 27, and 29-31 stand rejected. Claims 3, 6, 8, 11, 13, 15-17, 19, and 20 are amended. Claim 32 is newly added. This amendment add no new matter.

A fee calculation sheet for independent claims in excess of three, along with authorization to charge a deposit account in the amount of the calculated fee are submitted herewith.

In accordance with 37 C.F.R. 1.136(a), a petition for a one-month extension of time is submitted herewith to extend the due date of the response to the Office Action dated June 14, 2004, for the above-identified patent application from September 14, 2004, through and including October 14, 2004. In accordance with 37 C.F.R. 1.17(a)(1), authorization to charge a deposit account in the amount of \$110.00 to cover this extension of time request also is submitted herewith.

The objection to the drawings under 37 CFR 1.83(a) is respectfully traversed.

New Figure 3 is added which schematically depicts a Nuclear Magnetic Resonance (NMR) system as referenced in the specification and claims. Figure 3 adds no new matter.

The objection to Claims 12-20 is respectfully traversed. Claims 13 and 17 have been amended and are now independent claims. Claim 12 has been canceled. Each of Claims 13 and 17 is directed to an imaging system to remove any ambiguity in the claims. Accordingly, Applicant respectfully requests that the objection to Claims 12-20 be withdrawn.

The rejection of claims 1, 11, 12, 20, 21, and 29 35 U.S.C. § 102(a) as being anticipated by Cenic et al. is respectfully traversed. Claims 1, 12, 21, and 29 have been canceled.

Cenic et al. describe the experimental validation of a dynamic CT method for the absolute measurement of cerebral blood flow (CBF) in brain tumors as a model for tissues with a permeable blood-brain barrier (BBB) or blood-tissue barrier. The deconvolution of an equation for measuring contrast enhancement over time for a brain region is described. Notably, Cenic et al. makes no mention of constraints in the deconvolution.

Claim 11 depends from Claim 3 which recites a method for determining tissue type, the method including “quantitatively determining a tissue blood flow (TBF) by deconvoluting $Q(t)$ and $C_a(t)$, where $Q(t)$ is a tissue residue function and represents a curve of specific mass of contrast in tissue, and $C_a(t)$ represents an arterial curve of contrast concentration for a tissue having a blood stream containing a contrast without leaking the contrast into an interstitial space of the tissue by solving a matrix equation of $Q=Ah$ for a vector h , and determining a least squares solution for the vector h under an equality constraint, wherein vector h includes a plurality of elements comprising an impulse residue function at different times, Q comprises a vector including elements comprising values of a tissue residue function at different times, A comprises a matrix formed by values of the arterial curve of contrast concentration at different times; quantitatively determining a tissue blood volume (TBV) by deconvoluting $Q(t)$ and $C_a(t)$, quantitatively determining a TBV comprises quantitatively determining a TBV for the tissue by solving the matrix equation of $Q=Ah$ for the vector h , and determining a least squares solution for the vector h under an equality constraint; quantitatively determining a tissue mean transit time (TMTT) by deconvoluting $Q(t)$ and $C_a(t)$, quantitatively determining a TMTT comprises quantitatively determining a TMTT for the tissue by solving the matrix equation of $Q=Ah$ for the vector h , and determining a least squares solution for the vector h under an equality constraint; and determining a tissue type based on the TBF, the TBV, and the TMTT”.

Cenic et al. do not describe or suggest a method for determining tissue type, the method including quantitatively determining a tissue blood flow (TBF) by deconvoluting $Q(t)$ and $C_a(t)$, where $Q(t)$ is a tissue residue function and represents a curve of specific mass of contrast in tissue, and $C_a(t)$ represents an arterial curve of contrast concentration for a tissue having a blood stream containing a contrast without leaking the contrast into an interstitial space of the tissue by solving a matrix equation of $Q=Ah$ for a vector h , and determining a least squares solution for the vector h under an equality constraint, wherein vector h includes a plurality of elements comprising an impulse residue function at different times, Q comprises a vector including elements comprising values of a tissue residue function at different times, A comprises a matrix formed by values of the arterial curve of contrast concentration at different times, quantitatively determining a tissue blood volume (TBV) by deconvoluting $Q(t)$ and $C_a(t)$, quantitatively determining a TBV comprises quantitatively determining a TBV for the tissue by solving the matrix equation of $Q=Ah$ for the vector h , and determining a least squares solution for the vector h under an equality constraint, quantitatively determining a tissue mean transit time (TMTT) by deconvoluting $Q(t)$ and $C_a(t)$, quantitatively determining a TMTT comprises quantitatively determining a TMTT for the tissue by solving the matrix equation of $Q=Ah$ for the vector h , and determining a least squares solution for the vector h under an equality constraint; and determining a tissue type based on the TBF, the TBV, and the TMTT. Moreover, Cenik et al. do not describe or suggest deconvoluting solutions for TBF, TBV, or TMTT that includes a least squares solution under an equality constraint. Rather, Cenik et al. describe deconvolution with no mention of a least squares solution or of an equality constraint.

For the reasons set forth above, Claim 3 is submitted to be patentable over Cenik et al.

Claim 11 depends from independent Claim 3. When the recitations of Claim 11 are considered in combination with the recitations of Claim 3, Applicant submits that dependent Claim 11 likewise is patentable over Cenik et al.

Claim 20 depends from Claim 17 which recites an imaging system including at least one of a computed tomography system and a nuclear magnetic resonance system, the imaging system configured to “measure $Q(t)$ and $C_a(t)$, where $Q(t)$ is a tissue residue function and represents a curve of specific mass of contrast in tissue, and $C_a(t)$ represents an arterial curve of contrast concentration; quantitatively determine a tissue blood flow (TBF) for a tissue having a blood stream containing a contrast with leaking the contrast into an interstitial space of the tissue by solving a matrix equation of $Q=Ax$ from the linearization of the tissue residue function for a vector x , wherein vector x includes a plurality of elements comprising TBF, tissue blood volume (TBV), tissue mean transit time (TMTT), tissue permeability surface area product (TPS) and combinations thereof, Q comprises a vector including elements comprising values of a tissue residue function at different times, A comprises a matrix formed by values of the arterial curve of contrast concentration and tissue residue function at different times and combinations thereof; quantitatively determine a TBV for the tissue by solving the matrix equation of $Q=Ax$ for the vector x ; quantitatively determine a TMTT for the tissue by solving the matrix equation of $Q=Ax$ for the vector x ; quantitatively determine a TPS for the tissue by solving the matrix equation of $Q=Ax$ for the vector x ; and determine a tissue type based on the TBF, the TBV, the TMTT, and the TPS”.

Cenic et al. do not describe or suggest an imaging system including at least one of a computed tomography system and a nuclear magnetic resonance system, the imaging system configured to measure $Q(t)$ and $C_a(t)$, where $Q(t)$ is a tissue residue function and represents a curve of specific mass of contrast in tissue, and $C_a(t)$ represents an arterial curve of contrast concentration, quantitatively determine a tissue blood flow (TBF) for a tissue having a blood stream containing a contrast with leaking the contrast into an interstitial space of the tissue by solving a matrix equation of $Q=Ax$ from the linearization of the tissue residue function for a vector x , wherein vector x includes a plurality of elements comprising TBF, tissue blood volume (TBV), tissue mean transit time (TMTT), tissue permeability surface area product (TPS) and combinations thereof, Q comprises a vector including elements comprising values of a tissue

residue function at different times, A comprises a matrix formed by values of the arterial curve of contrast concentration and tissue residue function at different times and combinations thereof, quantitatively determine a TBV for the tissue by solving the matrix equation of $Q=Ax$ for the vector x, quantitatively determine a TMTT for the tissue by solving the matrix equation of $Q=Ax$ for the vector x, quantitatively determine a TPS for the tissue by solving the matrix equation of $Q=Ax$ for the vector x, and determine a tissue type based on the TBF, the TBV, the TMTT, and the TPS. Moreover, Cenic et al. do not describe or suggest solving a matrix equation of $Q=Ax$ from the linearization of the tissue residue function. Rather, Cenic et al. make no mention of linearizing the tissue residue function to obtain a system of linear equations in solving a matrix equation of the form $Q=Ax$ with Q, A, and x defined as set out in Claim 17.

For the reasons set forth above, Claim 17 is submitted to be patentable over Cenic et al.

Claim 20 depends from independent Claim 17. When the recitations of Claim 20 are considered in combination with the recitations of Claim 17, Applicant submits that dependent Claim 20 likewise is patentable over Cenic et al.

For at least the reasons set forth above, Applicant respectfully requests that the Section 102(a) rejection of Claims 11 and 20 be withdrawn. Claims 1, 12, 21, and 29 have been canceled.

The rejection of Claims 2, 3, 6, 7, 9, 10, 13, 14, 17, 18, 22, 23, 26, 27, 30, and 31 under 35 U.S.C. § 103(a) as being unpatentable over Cenic et al. in view of Ostergaard et al. is respectfully traversed. Claims 2, 9, 10, 14, 22, 23, 26, 27, 30, and 31 have been canceled.

Cenic et al. is described above. Ostergaard et al. describe a study to determine a mathematical approach to determine flow and vascular tracer retention by deconvolution of dynamic MRI tissue concentration curves with noninvasively determined arterial input curves. The study describes a modified model dependent technique and a model independent approach

for deconvolving an equation for the concentration of a tracer within a given volume of interest (VOI) of tissue. The model dependent approach uses nonlinear least squared fitting. The model independent technique includes a transform approach and an algebraic approach to solving Fredholm integral equations. Notably, Ostergaard makes no mention of constraints in the deconvolution of the concentration equation.

Claim 3 recites a method for determining tissue type, the method including “quantitatively determining a tissue blood flow (TBF) by deconvoluting $Q(t)$ and $C_a(t)$, where $Q(t)$ is a tissue residue function and represents a curve of specific mass of contrast in tissue, and $C_a(t)$ represents an arterial curve of contrast concentration for a tissue having a blood stream containing a contrast without leaking the contrast into an interstitial space of the tissue by solving a matrix equation of $Q=Ah$ for a vector h , and determining a least squares solution for the vector h under an equality constraint, wherein vector h includes a plurality of elements comprising an impulse residue function at different times, Q comprises a vector including elements comprising values of a tissue residue function at different times, A comprises a matrix formed by values of the arterial curve of contrast concentration at different times; quantitatively determining a tissue blood volume (TBV) by deconvoluting $Q(t)$ and $C_a(t)$, quantitatively determining a TBV comprises quantitatively determining a TBV for the tissue by solving the matrix equation of $Q=Ah$ for the vector h , and determining a least squares solution for the vector h under an equality constraint; quantitatively determining a tissue mean transit time (TMTT) by deconvoluting $Q(t)$ and $C_a(t)$, quantitatively determining a TMTT comprises quantitatively determining a TMTT for the tissue by solving the matrix equation of $Q=Ah$ for the vector h , and determining a least squares solution for the vector h under an equality constraint; and determining a tissue type based on the TBF, the TBV, and the TMTT”.

Neither Cenic et al. nor Ostergaard et al., considered alone or in combination, describe or suggest a method for determining tissue type, the method including quantitatively determining a tissue blood flow (TBF) by deconvoluting $Q(t)$ and $C_a(t)$, where $Q(t)$ is a tissue residue function

and represents a curve of specific mass of contrast in tissue, and $C_a(t)$ represents an arterial curve of contrast concentration for a tissue having a blood stream containing a contrast without leaking the contrast into an interstitial space of the tissue by solving a matrix equation of $Q=Ah$ for a vector h , and determining a least squares solution for the vector h under an equality constraint, wherein vector h includes a plurality of elements comprising an impulse residue function at different times, Q comprises a vector including elements comprising values of a tissue residue function at different times, A comprises a matrix formed by values of the arterial curve of contrast concentration at different times, quantitatively determining a tissue blood volume (TBV) by deconvoluting $Q(t)$ and $C_a(t)$, quantitatively determining a TBV comprises quantitatively determining a TBV for the tissue by solving the matrix equation of $Q=Ah$ for the vector h , and determining a least squares solution for the vector h under an equality constraint, quantitatively determining a tissue mean transit time (TMTT) by deconvoluting $Q(t)$ and $C_a(t)$, quantitatively determining a TMTT comprises quantitatively determining a TMTT for the tissue by solving the matrix equation of $Q=Ah$ for the vector h , and determining a least squares solution for the vector h under an equality constraint, and determining a tissue type based on the TBF, the TBV, and the TMTT. Moreover, neither Cenic et al. nor Ostergaard et al., considered alone or in combination, describe or suggest deconvoluting solutions for TBF, TBV, or TMTT that include determining a (TBF), a TBV, and a TMTT by solving a matrix equation of $Q=Ah$ for a vector h , and determining a least squares solution for the vector h under an equality constraint. Rather, Cenic et al. describe deconvolution with no mention of an equality constraint, and Ostergaard et al. describe model dependent and model independent deconvolution techniques, neither of which includes an equality constraint.

For the reasons set forth above, Claim 3 is submitted to be patentable over Cenic et al. in view of Ostergaard et al.

Claim 11 depends from independent Claim 3. When the recitations of Claim 11 are considered in combination with the recitations of Claim 3, Applicant submits that dependent Claim 11 likewise is patentable over Cenic et al. in view of Ostergaard et al.

Claim 6 recites a method for determining tissue type, the method including “quantitatively determining a tissue blood flow (TBF) by deconvoluting $Q(t)$ and $C_a(t)$, and their combinations thereof, where $Q(t)$ is a tissue residue function and represents a curve of specific mass of contrast in tissue, and $C_a(t)$ represents an arterial curve of contrast concentration for a tissue having a blood stream containing a contrast with leaking the contrast into an interstitial space of the tissue by solving a matrix equation of $Q=Ax$ from the linearization of the tissue residue function for a vector x , wherein vector x includes a plurality of elements comprising TBF, tissue blood volume TBV, tissue mean transit time TMTT, tissue permeability surface area TPS and combinations thereof, Q comprises a vector including elements comprising values of a tissue residue function at different times, A comprises a matrix formed by values of the arterial curve of contrast concentration and tissue residue function at different times and their combinations thereof, quantitatively determining a TBF comprises quantitatively determining a TBF for the tissue by solving the matrix equation of $Q=Ax$ for the vector x , quantitatively determining a TBV comprises quantitatively determining a TBV for the tissue by solving the matrix equation of $Q=Ax$ for the vector x , quantitatively determining a TMTT comprises quantitatively determining a TMTT for the tissue by solving the matrix equation of $Q=Ax$ for the vector x , quantitatively determining a TPS comprises quantitatively determining a TPS for the tissue by solving the matrix equation of $Q=Ax$ for the vector x ; and determining a tissue type based on the TBF, TBV, TMTT, and the TPS”.

Neither Cenic et al. nor Ostergaard et al., considered alone or in combination, describe or suggest a method for determining tissue type that includes quantitatively determining a tissue blood flow (TBF) by deconvoluting $Q(t)$ and $C_a(t)$, and their combinations thereof, where $Q(t)$ is a tissue residue function and represents a curve of specific mass of contrast in tissue, and $C_a(t)$

represents an arterial curve of contrast concentration for a tissue having a blood stream containing a contrast with leaking the contrast into an interstitial space of the tissue by solving a matrix equation of $Q=Ax$ from the linearization of the tissue residue function for a vector x , wherein vector x includes a plurality of elements comprising TBF, tissue blood volume TBV, tissue mean transit time TMTT, tissue permeability surface area TPS and combinations thereof, wherein Q includes a vector including elements including values of a tissue residue function at different times, A includes a matrix formed by values of the arterial curve of contrast concentration and the tissue residue function at different times and their combinations thereof, quantitatively determining a TBF includes quantitatively determining a TBF for the tissue by solving the matrix equation of $Q=Ax$ for the vector x , quantitatively determining a TBV includes quantitatively determining a TBV for the tissue by solving the matrix equation of $Q=Ax$ for the vector x , quantitatively determining a TMTT includes quantitatively determining a TMTT for the tissue by solving the matrix equation of $Q=Ax$ for the vector x , quantitatively determining a TPS includes quantitatively determining a TPS for the tissue by solving the matrix equation of $Q=Ax$ for the vector x , and determining a tissue type based on the TBF, TBV, TMTT, and the TPS.

Moreover, neither Cenic et al. nor Ostergaard et al., considered alone or in combination, describe or suggest linearizing the tissue residue function to obtain a system of linear equations in the form $Q=Ax$ with Q , A , and x defined as set out in Claim 6. Rather, Cenic et al. describe deconvolution with no mention of linearizing the tissue residue function, and Ostergaard et al. describe model dependent and model independent deconvolution techniques without mention of linearizing the tissue residue function, neither of which can be applied to tissue having a blood stream containing a contrast with leaking the contrast into an interstitial space of the tissue to determine TBF, TBV, TMTT, and the TPS.

For the reasons set forth above, Claim 6 is submitted to be patentable over Cenic et al. in view of Ostergaard et al.

Claim 7 depends from independent Claim 6. When the recitations of Claim 7 are considered in combination with the recitations of Claim 6, Applicant submits that dependent Claim 7 likewise is patentable over Cenic et al. in view of Ostergaard et al.

Claim 13 recites an imaging system including at least one of a computed tomography system and a nuclear magnetic resonance system, the imaging system configured to “measure $Q(t)$ and $C_a(t)$, where $Q(t)$ is a tissue residue function and represents a curve of specific mass of contrast in tissue, and $C_a(t)$ represents an arterial curve of contrast concentration; quantitatively determine a tissue blood flow (TBF) for a tissue having a blood stream containing a contrast without leaking the contrast into an interstitial space of the tissue by solving a matrix equation of $Q=Ah$ for a vector h , and determining a least squares solution for the vector h under an equality constraint, wherein vector h includes a plurality of elements comprising an impulse residue function at different times, Q comprises a vector including elements comprising values of a tissue residue function at different times, A comprises a matrix formed by values of the arterial curve of contrast concentration at different times; quantitatively determine a tissue blood volume (TBV) for the tissue by solving the matrix equation of $Q=Ah$ for the vector h , and determining a least squares solution for the vector h under an equality constraint; quantitatively determine a TMTT for the tissue by solving the matrix equation of $Q=Ah$ for the vector h , and determining a least squares solution for the vector h under an equality constraint; and determine a tissue type based on the TBF, the TBV, and the TMTT”.

Neither Cenic et al. nor Ostergaard et al., considered alone or in combination, describe or suggest an imaging system including at least one of a computed tomography system and a nuclear magnetic resonance system, wherein the imaging system is configured to measure $Q(t)$ and $C_a(t)$, where $Q(t)$ is a tissue residue function and represents a curve of specific mass of contrast in tissue, and $C_a(t)$ represents an arterial curve of contrast concentration, quantitatively determine a tissue blood flow (TBF) for a tissue having a blood stream containing a contrast without leaking the contrast into an interstitial space of the tissue by solving a matrix equation of

$Q=Ah$ for a vector h , and determining a least squares solution for the vector h under an equality constraint, wherein vector h includes a plurality of elements including an impulse residue function at different times, Q includes a vector including elements including values of a tissue residue function at different times, A includes a matrix formed by values of the arterial curve of contrast concentration at different times, quantitatively determine a tissue blood volume (TBV) for the tissue by solving the matrix equation of $Q=Ah$ for the vector h , and determining a least squares solution for the vector h under an equality constraint, quantitatively determine a TMTT for the tissue by solving the matrix equation of $Q=Ah$ for the vector h , and determining a least squares solution for the vector h under an equality constraint, and determine a tissue type based on the TBF, the TBV, and the TMTT. Moreover, neither Cenic et al. nor Ostergaard et al., considered alone or in combination, describe or suggest determining a (TBF), a TBV, and a TMTT by solving a matrix equation of $Q=Ah$ for a vector h , and determining a least squares solution for the vector h under an equality constraint. Rather, Cenic et al. describe deconvolution with no mention of an equality constraint, and Ostergaard et al. describe model dependent and model independent deconvolution techniques, neither of which includes an equality constraint.

For the reasons set forth above, Claim 13 is submitted to be patentable over Cenic et al. in view of Ostergaard et al.

Claim 17 recites an imaging system comprising at least one of a computed tomography system and a nuclear magnetic resonance system, the imaging system configured to “measure $Q(t)$ and $C_a(t)$, where $Q(t)$ is a tissue residue function and represents a curve of specific mass of contrast in tissue, and $C_a(t)$ represents an arterial curve of contrast concentration; quantitatively determine a tissue blood flow (TBF) for a tissue having a blood stream containing a contrast with leaking the contrast into an interstitial space of the tissue by solving a matrix equation of $Q=Ax$ from the linearization of the tissue residue function for a vector x , wherein vector x includes a plurality of elements comprising TBF, tissue blood volume (TBV), tissue mean transit time (TMTT), tissue permeability surface area product (TPS) and combinations thereof, Q comprises

a vector including elements comprising values of a tissue residue function at different times, A comprises a matrix formed by values of the arterial curve of contrast concentration and tissue residue function at different times and combinations thereof; quantitatively determine a TBV for the tissue by solving the matrix equation of $Q=Ax$ for the vector x; quantitatively determine a TMTT for the tissue by solving the matrix equation of $Q=Ax$ for the vector x; quantitatively determine a TPS for the tissue by solving the matrix equation of $Q=Ax$ for the vector x; and determine a tissue type based on the TBF, the TBV, the TMTT, and the TPS”.

Neither Cenic et al. nor Ostergaard et al., considered alone or in combination, describe or suggest an imaging system that is configured to measure $Q(t)$ and $C_a(t)$, where $Q(t)$ is a tissue residue function and represents a curve of specific mass of contrast in tissue, and $C_a(t)$ represents an arterial curve of contrast concentration, quantitatively determine a tissue blood flow (TBF) for a tissue having a blood stream containing a contrast with leaking the contrast into an interstitial space of the tissue by solving a matrix equation of $Q=Ax$ from the linearization of the tissue residue function for a vector x, wherein vector x includes a plurality of elements including TBF, tissue blood volume (TBV), tissue mean transit time (TMTT), tissue permeability surface area product (TPS) and combinations thereof, Q includes a vector including elements including values of a tissue residue function at different times, A includes a matrix formed by values of the arterial curve of contrast concentration and tissue residue function at different times and combinations thereof, quantitatively determine a TBV for the tissue by solving the matrix equation of $Q=Ax$ for the vector x, quantitatively determine a TMTT for the tissue by solving the matrix equation of $Q=Ax$ for the vector x, quantitatively determine a TPS for the tissue by solving the matrix equation of $Q=Ax$ for the vector x, and determine a tissue type based on the TBF, the TBV, the TMTT, and the TPS.

Moreover, neither Cenic et al. nor Ostergaard et al., considered alone or in combination, describe or suggest linearizing the tissue residue function to obtain a system of linear equations in the form $Q=Ax$ with Q, A, and x defined as set out in Claim 17. Rather, Cenic et al. describe

deconvolution with no mention of linearizing the tissue residue function, and Ostergaard et al. describe model dependent and model independent deconvolution techniques without mention of linearizing the tissue residue function, neither of which can be applied to tissue having a blood stream containing a contrast with leaking the contrast into an interstitial space of the tissue to determine TBF, TBV, TMTT, and the TPS.

For the reasons set forth above, Claim 17 is submitted to be patentable over Cenic et al. in view of Ostergaard et al.

Claim 18 depends from independent Claim 17. When the recitations of Claim 18 are considered in combination with the recitations of Claim 17, Applicant submits that dependent Claim 18 likewise is patentable over Cenic et al. in view of Ostergaard et al.

For at least the reasons set forth above, Applicant respectfully requests that the Section 103(a) rejection of Claims 3, 6, 7, 9, 10, 13, 14, 17, and 18 be withdrawn. Claims 2, 22, 23, 26, 27, 30, and 31 have been canceled.

The objection to Claims 4, 5, 8, 24, 25, and 28 is respectfully traversed. Claims 24, 25, and 28 have been canceled.

Claims 4, 5, and 8 depend from independent Claim 3, which is submitted to be in condition for allowance. When the recitations of Claims 4, 5, and 8 are considered in combination with the recitations of Claim 3, Applicant respectfully submits that dependent Claims 4, 5, and 8 are also patentable over the cited art.

For the reasons set forth above, Applicant respectfully requests that the objection to Claims 4, 5, and 8 be withdrawn. Claims 24, 25, and 28 have been canceled.

The objection to Claims 15, 16, and 19 is respectfully traversed. Claim 19 has been canceled.

Claims 15 and 16 depend from independent Claim 13, which is submitted to be in condition for allowance. When the recitations of Claims 15 and 16 are considered in combination with the recitations of Claim 13, Applicant respectfully submits that dependent Claims 15 and 16 are also patentable over the cited art.

For the reasons set forth above, Applicant respectfully requests that the objection to Claims 15, 16, and 19 be withdrawn.

Newly added Claim 32 depends from independent Claim 6, which is submitted to be in condition for allowance. When the recitations of Claim 32 are considered in combination with the recitations of Claim 6, Applicant respectfully submits that dependent Claim 32 is also patentable over the cited art.

In view of the foregoing amendments and remarks, all the claims now active in this application are believed to be in condition for allowance. Reconsideration and favorable action is respectfully solicited.

Respectfully Submitted,

A handwritten signature in black ink, appearing to read "Thomas M. Fisher", is written over a horizontal line.

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